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EXAMINER

DI MALINOWITZ

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This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

OFFICE ACTION SUMMARY

- ☒ Responsive to communication(s) filed on 30 March 1998
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

- ☒ Claim(s) 45-49; 51-84; 96; 181; 203-248 is/are pending in the application.
- Of the above, claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 45-49, 51-84, 96, 181, and 203-248 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) _____
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

- ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- ☐ Notice of Reference Cited, PTO-892
- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s) _____
- ☐ Interview Summary, PTO-413
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152

-SEE OFFICE ACTION ON THE FOLLOWING PAGES-

BEST AVAILABLE COPY

Art Unit: 1754

The Group and/or Art Unit location of your application in the PTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Group Art Unit 1754.

Since this application is eligible for the transitional procedure of 37 CFR 1.129(a), and the fee set forth in 37 CFR 1.17(r) has been timely paid, the finality of the previous Office action is hereby withdrawn pursuant to 37 CFR 1.129(a). Applicant's first submission after final filed on 30 March 1998 has been entered.

In response to applicant's query, the amendment filed 26 September 1997 under 37 CFR 1.116 was already entered at the time of mailing of the Advisory Action (05 November 1997). The re-presentation of said amendment on 30 March 1998 was redundant. Any confusion is regretted.

As a review, it is noted that claim 50 has been canceled, and claims 232-248 have been added.

Thus, the claims pending and active in this case are: Claims 45-49; 51-84; 96; 181; and 203-248.

Claims 45-49, 51-84, 96, 181 and 203-248 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 45, 181 and 233-234 and those dependent therefrom, it is unclear how much constitutes amounts capable of being extracted in "solid" form. The extraction in solid form

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language appears to be a means-plus-function limitation under 35 USC 112-6th paragraph. Since the specification fails to set forth the equivalents for this language, it fails to particularly point out and distinctly claim the invention as required under 35 USC 112-2nd paragraph: see, *In re Dossel*, 42 USPQ 2nd, 1881, at 1885.

It is also indefinite because, if, *arguendo*, a microgram of C_{60} qualified as a solid, would a process which produced a kilogram of soot which in toto contained microgram C_{60} (i.e., a parts-per-billion concentration) be within the claims (since 1 microgram C_{60} is "capable" of being extracted and "capable" of yielding 1 microgram solid C_{60} ?) Does the claimed process depend upon what scale it is run, i.e., how much "sooty carbon product" is made or collected, or whether the process is batch or continuous? The lower limit as to the scope of the claimed "amounts" is indefinite because it is unclear how much of anything is the accepted value to be considered a "solid". Note that a solid particle of colloidal gold can be 1.7×10^{-7} cm in size. Is this the order of magnitude which Applicants intend?

In claim 83, lines 4-7 and in claim 84, lines 5-7, and in claim 222, it is unclear as to what is the scope of "amounts (or quantities) (of C_{60}) sufficient to be capable of producing a . . . colored solution when extracted with sufficient (or effective) amounts of benzene". The extraction such that a colored solution is formed language appears to be a means-plus-function limitation under 35 USC 112-6th paragraph. Since the specification fails to set forth the equivalents for this language, it fails to particularly point out and distinctly claim the invention as required under 35 USC 112-2nd paragraph: see, *In re Dossel*, *vide supra*.

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It is also indefinite for the following reasons. Would a metric ton of “sooty carbon product” containing a gram of C_{60} (i.e., a ppm C_{60} concentration), and extracted with a liter of solvent, be within the scope of the claims (since quantities on the order of 1 gram C_{60} can impart color to solvent quantities on the order of one liter)? Note that the breadth of “extracted” does not preclude portionwise Soxhlet extraction of large quantities of “soot carbon product” (e.g., metric ton) with small quantities of solvent (e.g., liter). What then is the lower limit of the scope of the claims as to amount of C_{60} ?

In claims 234 and those dependent therefrom, it is unclear what is the scope of “discernible”. What analytical means are implied to “discern” a solid? Note that an electron microscope can sometimes be used to “discern” small solids such as viruses. Is this the scope which Applicants intend?

Claims 204, 213, 222, and 230 (and those dependent therefrom) require an extraction step to be conducted in such a manner such that crystalline C_{60} is formed. Claims 45 and 232 (and those dependent therefrom) require an extraction step to be conducted in such a manner such that macroscopic C_{60} is formed. This extraction language appears to be a means-plus-function limitation under 35 USC 112-6th paragraph. Since the specification fails to set forth the equivalents for this language, it fails to particularly point out and distinctly claim the invention as required under 35 USC 112-2nd paragraph: see, *In re Dossel*, *vide supra*.

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Claims 45-49, 51-82, 96, 203 and 232 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Note that there is no descriptive support for the word "macroscopic" in the claims. One of ordinary skill reading the specification as originally filed would not have reasonably expected claims to the large-scale "macroscopic" amounts which are now being claimed.

Claims 45-49, 51-82, 96, 203 and 232 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the preparation of a two-micron thick C_{60} coating, does not reasonably provide enablement for all macroscopic amounts of C_{60} . The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. Note that the specification is not a commensurately enabling one, since the scope of the claims is broadened from the original disclosure, in that they now embrace formation and isolation of very large tonnage quantities of C_{60} , while the original disclosure's literal language only supports production of C_{60} quantities sufficient to produce 2-micron thick coatings.

There is no disclosure supporting or describing larger quantities of C_{60} as are now embraced by the claims.

Claims 45-49, 51-84, 96, 181 and 203-248 of this application conflict with claims 57-63 and 68-87 of Application No. 08/486,669. 37 CFR 1.78(b) provides that when two or more

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applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 45-49, 51-84, 96, 181, 203-248 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 57-63 and 68-87 of copending Application No. 08/486,669. Although the conflicting claims are not identical, they are not patentably distinct from each other because the respective claims only differ in the functional recitation of how much C₆₀ fullerene is made in the carbon vaporization process. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have carried out the process of the instant claims, in view of the claims of

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the copending '669 application, because the claims of said copending application is directed to the same production and recovery of the same C60 as are the instant claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103 and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 45-49, 51-84, 96, 181, and 203-248 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kratschmer (article entitled "The Infrared ... Spectra of ... Carbon Dust"), in view of Hamilton (US-3,094,428), and Kargin (Colloid Journal of USSR).

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The Kratschmer article substantially identically recites the C_{60} -fullerene production steps of the instant application. More particularly, this reference teaches producing carbon smoke particles by resistive heating of graphite rods in an inert He quenching gas having a pressure of 100 torr. The smoke was collected on substrates. Infrared and ultraviolet spectroscopy of the collected substance was consistent with a C_{60} molecule of the soccerball structure. See entire document.

This article qualifies as prior art by virtue of section 102(a) of 35 USC, since it is technically a reference to "another", due to the presence of the Fostiropoulos co-author. Please see MPEP 2132.01, especially discussion therein to Ex Parte Kroger, 219 USPQ 370 (BPAI 1982).

This article does not appear to have "extracted" C_{60} from the smoke particles.

Hamilton '428 teaches that it is known to disperse carbon black in benzene in order to form ink compositions or rubber compositions. See col. 1, lines 50-65.

Kargin teaches that carbon particles made from the condensation of carbon vapor in an argon atmosphere, can be deemed to be carbon black. A graphite anode and cathode were opposed to each other and a plasma was formed therebetween by passing current to the electrodes. A solid product was collected on a quartz tube. See page 258, 18-22 and page 256, lines 10-36.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have dispersed the carbon smoke particles of the Kratschmer reference in benzene,

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thereby to have accomplished an extraction of C_{60} therefrom, because Hamilton teaches that it is known to disperse carbon black in benzene in order to form ink compositions or rubber compositions, and because Kargin would teach to the person of ordinary skill in the art to recognize Kratschmer's particles as being carbon black.

Please note that even those claims drawn to the recovery of "crystalline C_{60} " do not specify purity and embrace C_{60} in admixture with C_{70} and even graphite and "fullerenic soot" (the bulk of the "sooty carbon product of the instant claims". Thus these claims continue to embrace the trace quantities of C_{60} which would naturally be brought about upon application of Hamilton's benzene to the carbon product of Kratschmer, as per the teachings of Kargin.

Applicant's arguments filed 30 March 1998 have been fully considered but they are not persuasive.

The Declaration by Kratschmer is ineffective to overcome the section 103 rejection over the Kratschmer, Huffman, Fostiropoulos reference because there is rebuttal evidence that Fostiropoulos considers himself a co-inventor (see the book entitled "Perfect Symmetry: The Accidental Discovery of Buckminsterfullerene" by Jim Baggott, at page 279, lines 27-29), and there is evidence that he is more than a co-author.

In paragraphs 4 and 9 of said declaration, Declarant appears to be ascribing the basis for concluding that co-author Fostiropoulos was not a co-inventor, from a source who is neither a Declarant nor a co-author, namely, Applicants' counsel. It is not clear what standard Applicant's counsel applied.

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The declaration uses the language from the *In re Katz* (215 U.S.P.Q. 14) decision. It is noted that the language used in *Katz* is limited to where the examiner conceded that the disclaimed coauthors were “involved only with assay and testing features of the invention” (at 215 USPQ 18). It is not clear if Applicant’s counsel applied this part of the standard.

The holding of *In re Katz* is distinguishable from the facts in the instant case, because in the *Katz* case there was no evidence that the other co-author(s) could be considered more than mere co-authors, whereas in the instant case, there is evidence that the other co-author can be considered more than a mere co-author. This evidence, *inter alia*, is found on pages 138-139 of the Baggott book, where it is described that Fostiropoulos innovated in the matter of fabrication and use of carbon-13 rods; and on page 150 where it is described that Fostiropoulos innovated in the matter of sublimation of various C₆₀ films.

Note that the arguments previously presented by the examiner in papers #26 and 20 (i.e., the most recent Advisory Action and Final Rejection, respectively), are hereby incorporated by reference for brevity’s sake.

Any inquiry concerning this communication should be directed to Peter DiMauro at telephone number (703) 308-0680.



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